

# Wisconsin Retirement System

GASB Statement No. 68

Employer Reporting Accounting Schedules

December 31, 2021



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August 9, 2022

Employee Trust Funds Board  
Wisconsin Department of Employee  
Trust Funds  
4822 Madison Yards Way  
Madison, Wisconsin 53705

This report provides certain information requested by the Wisconsin Retirement System ("WRS") in connection with the Governmental Accounting Standards Board (GASB) Statement No. 68 "Accounting and Financial Reporting for Pensions."

The actuarial calculations in connection with this report were prepared for the purpose of complying with the requirements of GASB Statement No. 68. These calculations have been made on a basis that is consistent with our understanding of this Statement. Calculations for purposes of complying with the requirements of GASB Statement No. 67 will be provided in a separate report.

The total pension liability shown in this report is based on a roll-forward of the December 31, 2020 valuation liabilities to December 31, 2021. The calculation of the plan's liability for this report is not applicable for funding purposes of the plan. A calculation of the plan's liability for purposes other than satisfying the requirements of GASB Statement No. 68 may produce significantly different results. This report may be provided to parties other than the WRS only in its entirety and only with the permission of the WRS. GRS is not responsible for unauthorized use of this report.

The report was based upon information, furnished by the Department of Employee Trust Funds (DETF), concerning Retirement System benefits, financial transactions, and active members, terminated members, retirees and beneficiaries. We checked for internal and year-to-year consistency, but did not audit the data. We are not responsible for the accuracy or completeness of any data provided by DETF.

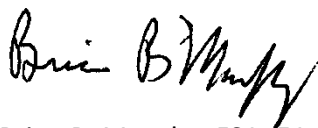
This report complements the actuarial valuation report that we provided to the Board and should be considered in conjunction with that report. Please see the actuarial valuation report as of December 31, 2020 for additional discussion of the nature of actuarial calculations and more information related to participant data, and benefit provisions. This valuation reflects revised economic and demographic assumptions adopted by the Board pursuant to the three-year experience study covering the period January 1, 2018 through December 31, 2020 of the Wisconsin Retirement System. See the experience study report dated November 19, 2021 for additional discussion regarding the economic and demographic assumptions used in this valuation.

This system-wide report is intended to assist in preparation of the financial statements of WRS and its participating employers. Financial statements are the responsibility of the reporting entity and not the actuary. The statements are subject to an auditor's review. Please let us know if the plan's auditor recommends any changes. Employer level schedules are developed by GRS and provided to DETF separately from this report.

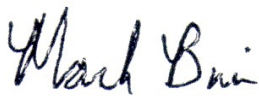
This report was prepared using our proprietary valuation model and related software which, in our professional judgment, has the capability to provide results that are consistent with the purposes of the valuation and has no material limitations or known weaknesses. We performed tests to ensure that the model reasonably represents that which is intended to be modeled.

To the best of our knowledge, the information contained in this report is accurate, and fairly represents the actuarial position of WRS. All calculations have been made in conformity with generally accepted actuarial principles and practices as well as with the Actuarial Standards of Practice issued by the Actuarial Standards Board. Brian B. Murphy, Mark Buis and James D. Anderson are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the Academy of Actuaries to render the actuarial opinions contained herein. The signing actuaries are independent of the plan sponsor.

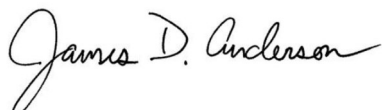
Respectfully submitted,  
Gabriel, Roeder, Smith & Company



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BBM/MB/JDA:dj



# SECTION A

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## EXECUTIVE SUMMARY

# Executive Summary as of December 31, 2021

	<u>2021</u>	<u>2020</u>
Actuarial Valuation Date	December 31, 2020	December 31, 2019
Measurement Date of the Net Pension Liability/(Asset)	December 31, 2021	December 31, 2020
<b>Membership as of December 31, 2020</b>		
Number of		
- Retirees and Beneficiaries	222,723	216,944
- Inactive, Nonretired Members	169,166	169,471
- Active Members	258,338	259,234
- Total	650,227	645,649
Covered Payroll <sup>(1)</sup>	\$ 15,780,837,258	\$ 15,359,928,023
<b>Net Pension Liability/(Asset)</b>		
Total Pension Liability	\$ 133,787,516,849	\$ 118,723,255,198
Plan Fiduciary Net Position	141,847,700,859	124,966,393,931
Net Pension Liability/(Asset)	\$ (8,060,184,010)	\$ (6,243,138,733)
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	106.02%	105.26%
Net Pension Liability/(Asset) as a Percentage of Covered Payroll	-51.08%	-40.65%
<b>Development of the Single Discount Rate</b>		
Single Discount Rate	6.80%	7.00%
Long-Term Expected Rate of Investment Return	6.80%	7.00%
Long-Term Municipal Bond Rate <sup>(2)</sup>	1.84%	2.00%
Last year ending December 31 in the 2022 to 2121 projection period for which projected benefit payments are fully funded	2121	2120
<b>Total Pension Expense/(Income)</b>	<b>\$ (696,710,877)</b>	<b>\$ (678,383,562)</b>

## Deferred Outflows and Deferred Inflows of Resources by Source to be Recognized in Future Pension Expenses

	<u>Deferred Outflows of Resources</u>	<u>Deferred Inflows of Resources</u>
Difference between expected and actual experience	\$ 13,020,819,855	\$ 938,941,721
Changes in assumptions	1,503,754,702	-
Net difference between projected and actual earnings on pension plan investments	-	18,031,301,850
<b>Total</b>	<b>\$ 14,524,574,557</b>	<b>\$ 18,970,243,571</b>

<sup>(1)</sup> Covered payroll is for 2021 and was provided by DETF.

<sup>(2)</sup> Source: Fixed-income municipal bonds with 20 years to maturity that include only federally tax-exempt municipal bonds as reported in Fidelity Index's "20-year Municipal GO AA Index" as of December 31, 2021. In describing this index, Fidelity notes that the Municipal Curves are constructed using option-adjusted analytics of a diverse population of over 10,000 tax-exempt securities. The municipal bond rate is used as the discount rate in years where assets are not projected to be sufficient to meet benefit payments.



# Discussion

## Accounting Standard

For state and local government employers (as well as certain non-employers) that contribute to a Defined Benefit (DB) pension plan administered through a trust or equivalent arrangement, Governmental Accounting Standards Board (GASB) Statement No. 68 establishes standards for pension accounting and financial reporting. Under GASB Statement No. 68, the employer must account for and disclose the net pension liability/(asset), pension expense/(income), and other information associated with providing retirement benefits to their employees (and former employees) on their basic financial statements.

The following discussion provides a summary of the information that is required to be disclosed under these accounting standards. A number of these disclosure items are provided in this report. However, certain information is not included in this report if it is not actuarial in nature, such as the notes to the financial statements regarding accounting policies and investments. As a result, the retirement system and/or plan sponsor is responsible for preparing and disclosing the non-actuarial information needed to comply with these accounting standards.

## Financial Statements

GASB Statement No. 68 requires state and local government employers that contribute to DB pension plans to recognize the net pension liability/(asset) and the pension expense/(income) on their financial statements, along with the related deferred outflows of resources and deferred inflows of resources. The net pension liability/(asset) is the difference between the total pension liability and the plan's fiduciary net position.

In traditional actuarial terms, this is analogous to the accrued liability less the market value of assets (not the smoothed actuarial value of assets that is often encountered in actuarial valuations performed to determine the employer's contribution requirement).

The pension expense/(income) recognized each fiscal year is equal to the change in the net pension liability/(asset) from the beginning of the year to the end of the year, adjusted for deferred recognition of the certain changes in the liability and investment experience.

It is our understanding that the WRS is a cost sharing multiple employer plan. The purpose of this report is to develop the required information in aggregate. Reporting for individual employers will be developed by GRS in accordance with each employer's proportionate share and reported to each employer by the DETF.

## Notes to Financial Statements

GASB Statement No. 68 requires the notes of the employer's financial statements to disclose the total pension expense/(income), the pension plan's liabilities and assets, and deferred outflows of resources and inflows of resources related to pensions.

In addition, GASB Statement No. 68 requires the notes of the financial statements for the employers to include certain additional information, including:

- A description of the types of benefits provided by the plan, as well as automatic or ad hoc COLAs;
- The number and classes of employees covered by the benefit terms;
- For the current year, sources of changes in the net pension liability/(asset);
- Significant assumptions and methods used to calculate the total pension liability;
- Inputs to the Single Discount Rate;
- Certain information about mortality assumptions and the dates of experience studies;
- The date of the valuation used to determine the total pension liability;
- Information about changes of assumptions or other inputs and benefit terms;
- The basis for determining contributions to the plan, including a description of the plan's funding policy, as well as member and employer contribution requirements;
- The total pension liability, fiduciary net position, net pension liability/(asset), and the pension plan's fiduciary net position as a percentage of the total pension liability;
- The net pension liability/(asset) using a discount rate that is 1% higher and 1% lower than used to calculate the total pension liability and net pension liability/(asset) for financial reporting purposes; and
- A description of the system that administers the pension plan.

## Required Supplementary Information

The financial statements of employers also include required supplementary information showing the 10-year fiscal history of:

- Sources of changes in the net pension liability/(asset);
- Information about the components of the net pension liability/(asset) and related ratios, including the pension plan's fiduciary net position as a percentage of the total pension liability, and the net pension liability/(asset) as a percent of covered-employee payroll; and
- Comparison of actual employer contributions to the actuarially determined contributions based on the plan's funding policy.

These schedules may be built prospectively.



## **General Implications of Contribution Allocation Procedure or Funding Policy on Future Expected Plan Contributions and Funded Status**

Given the plan's contribution allocation procedure, if all actuarial assumptions are met (including the assumption of the plan earning 6.80% on the actuarial value of assets), it is expected that:

1. The employer normal cost as a percentage of pay will decrease to the level of the future service normal cost as time passes.
2. The unfunded liability is expected to decrease in dollar amount until it is fully funded.
3. The funded status of the plan will remain very close to a 100% funded ratio.

This funding policy results in the expectation that the plan's assets will be able to fully pay for promised benefits through at least 2121. The projections in this report are strictly for the purpose of determining the GASB single discount rate and are different from a funding projection for the ongoing plan.

### **Limitations of Funded Status Measurements**

Unless otherwise indicated, a funded status measurement presented in this report is based upon the total pension liability and the market value of assets. Unless otherwise indicated, with regard to any funded status measurements presented in this report:

- (1) The measurement is inappropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations, in other words, of transferring the obligations to an unrelated third party in an arm's length market value type transaction.
- (2) The measurement is dependent upon the actuarial cost method which, in combination with the plan's amortization policy, affects the timing and amounts of future contributions. The amounts of future contributions will most certainly differ from those assumed in this report due to future actual experience differing from assumed experience based upon the actuarial assumptions. A funded status measurement in this report of 100% is not synonymous with no required future contributions. If the funded status were 100%, the plan would still require future normal cost contributions (i.e., contributions to cover the cost of the active membership accruing an additional year of service credit).
- (3) The measurement would produce a different result if the actuarial value of assets were used instead of the market value of assets.

### **Limitation of Project Scope**

Actuarial standards do not require the actuary to evaluate the ability of the plan sponsor or other contributing entity to make required contributions to the plan when due. Such an evaluation was not within the scope of this project and is not within the actuary's domain of expertise. Consequently, the actuary performed no such evaluation.

## Timing of the Valuation

An actuarial valuation to determine the total pension liability is required to be performed at least every two years. For the employer's financial reporting purposes, the net pension liability/(asset) and pension expense/(income) should be measured as of the employer's "measurement date" which may not be earlier than the employer's prior fiscal year-end date. If the actuarial valuation used to determine the total pension liability is not calculated as of the measurement date, the total pension liability is required to be rolled-forward from the actuarial valuation date to the measurement date.

The total pension liability shown in this report is based on an actuarial valuation performed as of December 31, 2020 with roll-forward to December 31, 2021 and a measurement date of December 31, 2021. The roll-forward included adjustments in the liability due to changes in dividend adjustments, if any, for current and future retired members.

## Single Discount Rate

Projected benefit payments are required to be discounted to their actuarial present values using a Single Discount Rate that reflects: (1) a long-term expected rate of return on pension plan investments (to the extent that the plan's fiduciary net position is projected to be sufficient to pay benefits); and (2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating as of the measurement date (to the extent that the plan's projected fiduciary net position is not sufficient to pay benefits).

For the purpose of this valuation, the expected rate of return on pension plan investments is 6.80%; the municipal bond rate is 1.84% (based on the daily rate closest to but not later than the measurement date of the Fidelity "20-Year Municipal GO AA Index"); and the resulting Single Discount Rate is 6.80%.

## Actuarial Assumptions and Methods and Member Census Data

The actuarial assumptions used in this study were adopted by the Board pursuant to the three-year experience study covering the period January 1, 2018 through December 31, 2020. The actuarial assumptions and methods employed for purposes of our Actuarial Study are shown in Section D of this report.

The member census data employed for purposes of our Actuarial Study was provided by DETF and is the same member census data used for the December 31, 2020 Actuarial Valuation Report of the Retirement System.

The Wisconsin Retirement System uses the Frozen Entry Age cost method for determining funding requirements. GASB Statement No. 68 requires the use of the Entry Age Normal cost method for accounting purposes. Therefore, we developed the Entry Age Normal Accrued Liability to reflect the Total Pension Liability for GASB purposes.

## SECTION B

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### FINANCIAL STATEMENTS

Auditor's Note – This information is presented in draft form for review by the Plan's auditor. Please let us know if there are any items that the auditor changes so that we may maintain consistency with the Plan's financial statements.

# Statement of Pension Expense/(Income) under GASB Statement No. 68 Fiscal Year Ended December 31, 2021

## A. Expense/(Income)

1. Service Cost	\$ 2,019,309,706
2. Interest on the Total Pension Liability	8,157,487,429
3. Current-Period Benefit Changes	0
4. Employee Contributions (made negative for addition here)	(1,086,781,945)
5. Projected Earnings on Plan Investments (made negative for addition here)	(8,601,513,783)
6. Pension Plan Administrative Expense	31,868,580
7. Other Changes in Plan Fiduciary Net Position	0
8. Recognition of Outflow (Inflow) of Resources due to Liabilities	4,927,645,776
9. Recognition of Outflow (Inflow) of Resources due to Assets	(6,144,726,640)
<b>10. Total Pension Expense/(Income)</b>	<b>\$ (696,710,877)</b>

# Statement of Outflows and Inflows Arising from Current Reporting Period Fiscal Year Ended December 31, 2021

## A. Outflows (Inflows) of Resources Due to Liabilities

1. Difference between expected and actual experience of the Total Pension Liability (gains) or losses <sup>(1)</sup>	\$ 9,453,083,785
2. Assumption Changes (gains) or losses	\$ 1,829,131,445
3. Recognition period for Liabilities: Average of the expected remaining service lives of all employees {in years}	4.6461
4. Outflow (Inflow) of Resources to be recognized in the current pension expense for the difference between expected and actual experience of the Total Pension Liability	\$ 2,034,627,706
5. Outflow (Inflow) of Resources to be recognized in the current pension expense for Assumption Changes	\$ 393,691,794
6. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Liabilities	<hr/> \$ 2,428,319,500
7. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for the difference between expected and actual experience of the Total Pension Liability	\$ 7,418,456,079
8. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for Assumption Changes	\$ 1,435,439,651
9. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Liabilities	<hr/> \$ 8,853,895,730

## B. Outflows (Inflows) of Resources Due to Assets

1. Net difference between projected and actual earnings on pension plan investments (gains) or losses	\$ (12,455,044,344)
2. Recognition period for Assets {in years}	5.0000
3. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Assets	\$ (2,491,008,869)
4. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets	\$ (9,964,035,475)

<sup>(1)</sup> Starting with 2015, this item includes the impact of known Market Recognition Account deferred gains/losses on the liability for dividend payments. See page 23 for a full description.



# Statement of Outflows and Inflows Arising from Current and Prior Reporting Periods Fiscal Year Ended December 31, 2021

## A. Outflows and Inflows of Resources Due to Liabilities and Assets to be Recognized in Current Pension Expense

	Outflows of Resources	Inflows of Resources	Net Outflows of Resources
1. Due to Liabilities	\$ 5,934,985,893	\$ 1,007,340,117	\$ 4,927,645,776
2. Due to Assets	-	6,144,726,640	(6,144,726,640)
<b>3. Total</b>	<b>\$ 5,934,985,893</b>	<b>\$ 7,152,066,757</b>	<b>\$ (1,217,080,864)</b>

## B. Outflows and Inflows of Resources by Source to be Recognized in Current Pension Expense

	Outflows of Resources	Inflows of Resources	Net Outflows of Resources
1. Differences between expected and actual experience	\$ 5,468,002,552	\$ 1,007,340,117	\$ 4,460,662,435
2. Assumption Changes	466,983,341	-	466,983,341
3. Net Difference between projected and actual earnings on pension plan investments	-	6,144,726,640	(6,144,726,640)
<b>4. Total</b>	<b>\$ 5,934,985,893</b>	<b>\$ 7,152,066,757</b>	<b>\$ (1,217,080,864)</b>

## C. Deferred Outflows and Deferred Inflows of Resources by Source to be Recognized in Future Pension Expenses

	Deferred Outflows of Resources	Deferred Inflows of Resources	Net Deferred Outflows of Resources
1. Differences between expected and actual experience	\$ 13,020,819,855	\$ 938,941,721	\$ 12,081,878,134
2. Assumption Changes	1,503,754,702	-	1,503,754,702
3. Net Difference between projected and actual earnings on pension plan investments	-	18,031,301,850	(18,031,301,850)
<b>4. Total</b>	<b>\$ 14,524,574,557</b>	<b>\$ 18,970,243,571</b>	<b>\$ (4,445,669,014)</b>

## D. Deferred Outflows and Deferred Inflows of Resources by Year to be Recognized in Future Pension Expenses

Year Ending December 31	Net Deferred Outflows of Resources
2022	\$ (376,170,366)
2023	(2,185,869,341)
2024	(961,557,669)
2025	(922,071,638)
2026	-
Thereafter	-
<b>Total</b>	<b>\$ (4,445,669,014)</b>

# Recognition of Deferred Outflows and Inflows of Resources

## Actuarial Valuation Date – December 31, 2020

## Measurement Date – December 31, 2021

## Reporting Date – December 31, 2021

Year Established	Initial Amount	Initial Recognition Period	Current Year Recognition	Remaining Recognition	Remaining Recognition Period
<b>Deferred Outflow (Inflow) Due to Differences Between Expected and Actual Experience on Liabilities</b>					
2016	\$ 150,347,332	5.0481	\$ 1,432,562	\$ -	0.0000
2017	4,459,497,323	5.0080	890,474,705	7,123,798	0.0080
2018	(4,968,302,189)	4.9321	(1,007,340,117)	(938,941,721)	0.9321
2019	5,473,337,212	4.6706	1,171,870,255	1,957,726,447	1.6706
2020	6,376,708,179	4.6559	1,369,597,324	3,637,513,531	2.6559
2021	9,453,083,785	4.6461	2,034,627,706	7,418,456,079	3.6461
<b>Total</b>			<b>\$ 4,460,662,435</b>	<b>\$ 12,081,878,134</b>	
<b>Deferred Outflow (Inflow) Due to Assumption Changes</b>					
2016	\$ -	5.0481	\$ -	\$ -	0.0000
2017	-	5.0080	-	-	0.0080
2018	361,481,239	4.9321	73,291,547	68,315,051	0.9321
2019	-	4.6706	-	-	1.6706
2020	-	4.6559	-	-	2.6559
2021	1,829,131,445	4.6461	393,691,794	1,435,439,651	3.6461
<b>Total</b>			<b>\$ 466,983,341</b>	<b>\$ 1,503,754,702</b>	
<b>Deferred Outflow (Inflow) Due to Differences Between Projected and Actual Earnings on Plan Investments</b>					
2017	\$ (8,311,360,334)	5.0000	\$ (1,662,272,066)	\$ -	0.0000
2018	11,435,938,911	5.0000	2,287,187,782	2,287,187,783	1.0000
2019	(12,407,231,511)	5.0000	(2,481,446,302)	(4,962,892,605)	2.0000
2020	(8,985,935,923)	5.0000	(1,797,187,185)	(5,391,561,553)	3.0000
2021	(12,455,044,344)	5.0000	(2,491,008,869)	(9,964,035,475)	4.0000
<b>Total</b>			<b>\$ (6,144,726,640)</b>	<b>\$ (18,031,301,850)</b>	

### Recognition of Deferred Outflows and Inflows of Resources

According to Paragraph 33 of GASB Statement No. 68, *differences between expected and actual experience* and *changes in assumptions* are recognized in pension expense using a systematic and rational method over a closed period equal to the average of the expected remaining service lives of all employees that are provided with pensions through the pension plan (active employees and inactive employees) determined as of the beginning of the measurement period.

At the beginning of the current measurement period, the expected remaining service lives of all active employees in the plan was approximately 3,021,016 years. Additionally, the total plan membership (active employees and inactive employees) was 650,227. As a result, the average of the expected remaining service lives for purposes of recognizing the applicable deferred outflows and inflows of resources established in the current measurement period is 4.6461 years.

Additionally, *differences between projected and actual earnings on pension plan investments* should be recognized in pension expense using a systematic and rational method over a closed five-year period.

In accordance with the requirements of GASB Statement No. 68, the deferred outflows and inflows of resources are recognized in the pension expense as level dollar amounts over the various remaining closed periods shown above.



# Schedule of Changes in Net Pension Liability/(Asset) and Related Ratios Current Period Fiscal Year Ended December 31, 2021

## A. Total pension liability

1. Service Cost	\$ 2,019,309,706
2. Interest on the total pension liability	8,157,487,429
3. Changes of benefit terms	-
4. Difference between expected and actual experience of the total pension liability	9,453,083,785
5. Changes of assumptions	1,829,131,445
6. Benefit payments, including refunds of employee contributions	(6,394,750,714)
7. Net change in total pension liability	\$ 15,064,261,651
8. Total pension liability – beginning	118,723,255,198
9. Total pension liability – ending	<u><u>\$ 133,787,516,849</u></u>

## B. Plan fiduciary net position

1. Contributions – employer	\$ 1,164,586,150
2. Contributions – employee	1,086,781,945
3. Net investment income	21,056,558,127
4. Benefit payments, including refunds of employee contributions	(6,394,750,714)
5. Pension plan administrative expense	(31,868,580)
6. Other	-
7. Net change in plan fiduciary net position	\$ 16,881,306,928
8. Plan fiduciary net position – beginning	124,966,393,931
9. Plan fiduciary net position – ending	<u><u>\$ 141,847,700,859</u></u>

## C. Net pension liability/(asset)

\$ (8,060,184,010)

## D. Plan fiduciary net position as a percentage of the total pension liability

106.02%

## E. Covered-employee payroll<sup>(1)</sup>

\$ 15,780,837,258

## F. Net pension liability/(asset) as a percentage of covered-employee payroll

-51.08%

<sup>(1)</sup> Covered payroll provided by DETF.



# Schedule of Changes in Net Pension Liability/(Asset) and Related Ratios Multiyear

Last 10 Fiscal Years (which may be built prospectively)

Fiscal year ending December 31,	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012
<b>Total Pension Liability</b>										
Service Cost	\$ 2,019,309,706	\$ 1,975,773,133	\$ 1,902,507,977	\$ 1,860,937,125	\$ 1,842,879,321	\$ 1,814,134,799	\$ 1,787,870,316	\$ 1,757,020,910	\$ 1,745,048,505	
Interest on the Total Pension Liability	8,157,487,429	7,480,695,373	6,888,058,586	7,169,731,242	6,627,171,441	6,372,404,646	6,347,123,575	6,089,287,273	5,680,664,977	
Benefit Changes	-	-	-	-	-	-	-	-	-	
Experience <sup>(1)</sup>	9,453,083,785	6,376,708,179	5,473,337,212	(4,968,302,189)	4,459,497,323	150,347,332	(4,247,328,263)	437,265,852	2,659,920,220	
Assumption Changes	1,829,131,445	-	-	361,481,239	-	-	1,412,040,786	-	-	
Benefit Payments	(6,352,709,068)	(5,939,365,686)	(5,646,263,647)	(5,516,188,518)	(5,211,266,989)	(5,022,920,827)	(4,823,586,513)	(4,540,247,874)	(4,224,700,261)	
Refunds	(42,041,646)	(38,857,677)	(44,106,052)	(40,234,768)	(38,358,098)	(39,275,602)	(37,642,404)	(34,401,181)	(33,271,143)	
<b>Net Change in Total Pension Liability</b>	<b>15,064,261,651</b>	<b>9,854,953,322</b>	<b>8,573,534,076</b>	<b>(1,132,575,869)</b>	<b>7,679,922,998</b>	<b>3,274,690,348</b>	<b>438,477,497</b>	<b>3,708,924,980</b>	<b>5,827,662,298</b>	
<b>Total Pension Liability - Beginning<sup>(2)</sup></b>	<b>118,723,255,198</b>	<b>108,868,301,876</b>	<b>100,294,767,800</b>	<b>101,427,343,669</b>	<b>93,747,420,671</b>	<b>90,129,650,901</b>	<b>89,691,173,404</b>	<b>85,982,248,424</b>	<b>80,154,586,126</b>	
<b>Total Pension Liability - Ending (a)</b>	<b>\$ 133,787,516,849</b>	<b>\$ 118,723,255,198</b>	<b>\$ 108,868,301,876</b>	<b>\$ 100,294,767,800</b>	<b>\$ 101,427,343,669</b>	<b>\$ 93,404,341,249</b>	<b>\$ 90,129,650,901</b>	<b>\$ 89,691,173,404</b>	<b>\$ 85,982,248,424</b>	
<b>Plan Fiduciary Net Position</b>										
Employer Contributions <sup>(3)</sup>	\$ 1,164,586,150	\$ 1,133,315,516	\$ 1,046,942,283	\$ 1,030,507,544	\$ 1,017,558,990	\$ 963,121,911	\$ 977,733,921	\$ 987,792,834	\$ 914,698,118	
Employee Contributions	1,086,781,945	1,053,242,596	987,662,027	972,950,131	965,452,633	921,863,806	937,225,184	941,903,267	871,259,789	
Pension Plan Net Investment Income	21,056,558,127	16,698,556,768	19,049,541,932	(4,049,354,577)	14,875,414,636	7,273,069,087	(673,122,812)	4,891,014,826	11,347,296,075	
Benefit Payments	(6,352,709,068)	(5,939,365,686)	(5,646,263,647)	(5,516,188,518)	(5,211,266,989)	(5,022,920,827)	(4,823,586,513)	(4,540,247,874)	(4,224,700,261)	
Refunds	(42,041,646)	(38,857,677)	(44,106,052)	(40,234,768)	(38,358,098)	(39,275,602)	(37,642,404)	(34,401,181)	(33,271,143)	
Pension Plan Administrative Expense	(31,868,580)	(33,256,008)	(34,197,722)	(31,612,198)	(26,132,873)	(20,426,189)	(22,708,614)	(24,036,951)	(22,857,502)	
Other	-	-	(3,901,654)	(25,448,686)	-	-	-	-	-	
<b>Net Change in Plan Fiduciary Net Position</b>	<b>16,881,306,928</b>	<b>12,873,635,509</b>	<b>15,355,677,167</b>	<b>(7,659,381,072)</b>	<b>11,582,668,299</b>	<b>4,075,432,186</b>	<b>(3,642,101,238)</b>	<b>2,222,024,921</b>	<b>8,852,425,076</b>	
<b>Plan Fiduciary Net Position - Beginning<sup>(4)</sup></b>	<b>124,966,393,931</b>	<b>112,092,758,422</b>	<b>96,737,081,255</b>	<b>104,396,462,327</b>	<b>92,813,794,028</b>	<b>88,504,670,309</b>	<b>92,146,771,547</b>	<b>89,924,746,626</b>	<b>81,072,321,550</b>	
<b>Plan Fiduciary Net Position - Ending (b)</b>	<b>\$ 141,847,700,859</b>	<b>\$ 124,966,393,931</b>	<b>\$ 112,092,758,422</b>	<b>\$ 96,737,081,255</b>	<b>\$ 104,396,462,327</b>	<b>\$ 92,580,102,495</b>	<b>\$ 88,504,670,309</b>	<b>\$ 92,146,771,547</b>	<b>\$ 89,924,746,626</b>	
<b>Net Pension Liability/(Asset) - Ending (a) - (b)</b>	<b>(8,060,184,010)</b>	<b>(6,243,138,733)</b>	<b>(3,224,456,546)</b>	<b>3,557,686,545</b>	<b>(2,969,118,658)</b>	<b>824,238,754</b>	<b>1,624,980,592</b>	<b>(2,455,598,143)</b>	<b>(3,942,498,202)</b>	
<b>Plan Fiduciary Net Position as a Percentage of Total Pension Liability</b>	<b>106.02 %</b>	<b>105.26 %</b>	<b>102.96 %</b>	<b>96.45 %</b>	<b>102.93 %</b>	<b>99.12 %</b>	<b>98.20 %</b>	<b>102.74 %</b>	<b>104.59 %</b>	
<b>Covered-Employee Payroll<sup>(5)</sup></b>	<b>\$ 15,780,837,258</b>	<b>\$ 15,359,928,023</b>	<b>\$ 14,832,491,878</b>	<b>\$ 14,301,446,269</b>	<b>\$ 13,943,116,649</b>	<b>\$ 13,706,000,000</b>	<b>\$ 13,530,500,000</b>	<b>\$ 13,219,500,000</b>	<b>\$ 12,884,800,000</b>	
<b>Net Pension Liability/(Asset) as a Percentage of Covered-Employee Payroll</b>	<b>(51.08)%</b>	<b>(40.65)%</b>	<b>(21.74)%</b>	<b>24.88 %</b>	<b>(21.29)%</b>	<b>6.01 %</b>	<b>12.01 %</b>	<b>(18.58)%</b>	<b>(30.60)%</b>	
<b>Notes to Schedule:</b>										

<sup>(1)</sup> Starting with 2015, this item includes the impact of known Market Recognition Account deferred gains/losses on the liability for dividend payments. See page 23 for a full description.

<sup>(2)</sup> In 2017, beginning of year liabilities were adjusted by \$343,079,422 to reflect the Long-Term Disability Insurance (LTDI) program -- this amount was provided in Milliman Inc.'s December 31, 2016 actuarial valuation of the Long Term Disability Insurance Plan dated April 21, 2017.

<sup>(3)</sup> Employer contributions shown in the above table includes Employer Required Contributions in addition to contributions paid by specific employers for unique circumstances such as Prior Service Contributions, Early Retirement Contributions, and Employer Additional Contributions.

<sup>(4)</sup> As of calendar year 2017, the LTDI program is reported within the Wisconsin Retirement System (WRS). Accordingly, there is an adjustment to the calendar year 2017 beginning net position of \$233,691,533 to reflect LTDI assets.

<sup>(5)</sup> Covered payroll provided by DETF.



# Schedule of Contributions Multiyear

## Last 10 Fiscal Years

<b>FY Ending December 31,</b>	<b>Actuarially Determined Contribution<sup>(1),(2)</sup></b>	<b>Actual Contribution</b>	<b>Contribution Deficiency (Excess)</b>	<b>Covered Payroll<sup>(3)</sup></b>	<b>Actual Contribution as a % of Covered Payroll</b>
2012					
2013	\$ 905,148,514	\$ 905,148,514	\$ -	\$ 12,884,800,000	7.02%
2014	977,068,988	977,068,988	-	13,219,500,000	7.39%
2015	967,730,052	967,730,052	-	13,530,500,000	7.15%
2016	954,159,009	954,159,009	-	13,706,000,000	6.96%
2017	1,014,870,679	1,014,870,679	-	13,943,116,649	7.28%
2018	1,028,390,526	1,028,390,526	-	14,301,446,269	7.19%
2019	1,044,964,610	1,044,964,610	-	14,832,491,878	7.05%
2020	1,131,486,002	1,131,486,002	-	15,359,928,023	7.37%
2021	1,162,794,127	1,162,794,127	-	15,780,837,258	7.37%

<sup>(1)</sup> Since it is the actuary's understanding that the System's practice is to require employers to contribute the percent-of-payroll employer contribution rate shown in the actuarial valuation report, the Actuarially Determined Contributions shown in the Schedule of Contributions are the actual contributions made by the participating employers in the fiscal year.

<sup>(2)</sup> Starting with 2016, Actuarially Determined Contributions includes Employer Required Contributions, paid by each employer based on a percentage of payroll. This amount excludes contributions paid by specific employers for unique circumstances such as Prior Service Contributions, Early Retirement Contributions, and Employer Additional Contributions.

<sup>(3)</sup> Covered payroll provided by DETF.

# Notes to Schedule of Contributions

## Summary of Actuarial Methods and Assumptions Used in the Calculation of the 2021 Actuarially Determined Contribution (ADC)

**Valuation Date:** December 31, 2019

**Methods and Assumptions Used to Determine Actuarial Contribution on prior page:**

Actuarial Cost Method	Frozen Entry Age
Amortization Method	Level Percent of Payroll - Closed Amortization Period
Amortization Period	30-Year closed from date of participation in WRS
Asset Valuation Method	5-Year smoothed value
Inflation	No specific price inflation assumption is required to perform this valuation. The price inflation assumption used to evaluation the investment return assumption is 2.5%.
Salary Increases	3.1% to 8.6% including inflation
Net Investment Rate of Return	5.40%
Weighted based on assumed rate for:	
Retired participants	5.00%
Active participants	
Post-retirement participants	5.00%
Pre-retirement participants	7.00%
Retirement Age	Experience-based table of rates that are specific to the type of eligibility condition. Last updated for the 2018 valuation pursuant to an experience study of the period 2015-2017.
Mortality	Wisconsin 2018 mortality table adjusted for future mortality improvements using the MP-2018 fully generational improvement scale (multiplied by 60%).

**Other Information:**

**Notes** The actuarially determined contribution for calendar year 2021 was determined from the December 31, 2019 actuarial valuation.



## Single Discount Rate

A single discount rate of 6.80% was used to measure the total pension liability, which was based on the expected rate of return on pension plan investments. Because of the unique structure of WRS, the 6.80% expected rate of return implies that a dividend of approximately 1.7% will always be paid after reflecting known changes in the Market Recognition Account. For purposes of the single discount rate, it was assumed that the dividend would always be paid. The projection of cash flows used to determine this single discount rate assumed that plan member contributions will be made at the current contribution rate and that employer contributions will be made at rates equal to the difference between actuarially determined contribution rates and the member rate. Based on these assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments (including expected dividends) of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

Regarding the sensitivity of the net pension liability/(asset) to changes in the single discount rate, the following presents the plan's net pension liability/(asset), calculated using a single discount rate of 6.80%, as well as what the plan's net pension liability/(asset) would be if it were calculated using a single discount rate that is 100 basis points lower or 100 basis points higher:

### Sensitivity of Net Pension Liability/(Asset) to the Single Discount Rate Assumption

	Current Single Discount		
	1% Decrease	Rate Assumption	1% Increase
Discount Rate	<b>5.80%</b>	<b>6.80%</b>	<b>7.80%</b>
Ultimate Dividend Rate	<b>1.7%</b>	<b>1.7%</b>	<b>1.7%</b>
Total Pension Liability	\$ 147,566,972,904	\$ 133,787,516,849	\$ 123,868,872,425
Plan Fiduciary Net Position	141,847,700,859	141,847,700,859	141,847,700,859
Net Pension Liability/(Asset)	\$ 5,719,272,045	\$ (8,060,184,010)	\$ (17,978,828,434)

This schedule above is presented because it is required by GASB standards. Users of this report should not conclude that the authors view the upper end of the range as reasonable. For the WRS, the determination of liabilities also depends on the assumed dividend which is linked to the interest rate used in the liability calculation. Therefore, we have also shown an alternative set of Sensitivity Analysis which varies the assumed dividend in conjunction with the change in the discount rate. For the liabilities shown below, the assumed dividend was 0.8% for the 5.80% discount rate, 1.7% for the 6.80% discount rate, and 2.7% for the 7.80% discount rate.

### Sensitivity of Net Pension Liability/(Asset) to the Single Discount Rate Assumption

	Current Single Discount		
	1% Decrease	Rate Assumption	1% Increase
Discount Rate	<b>5.80%</b>	<b>6.80%</b>	<b>7.80%</b>
Ultimate Dividend Rate	<b>0.8%</b>	<b>1.7%</b>	<b>2.7%</b>
Total Pension Liability	\$ 139,249,229,708	\$ 133,787,516,849	\$ 129,828,536,384
Plan Fiduciary Net Position	141,847,700,859	141,847,700,859	141,847,700,859
Net Pension Liability/(Asset)	\$ (2,598,471,151)	\$ (8,060,184,010)	\$ (12,019,164,475)

## SECTION C

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### **CALCULATION OF THE SINGLE DISCOUNT RATE**

Auditor's Note – This information is presented in draft form for review by the Plan's auditor. Please let us know if there are any items that the auditor changes so that we may maintain consistency with the Plan's financial statements.

## Calculation of the Single Discount Rate

GASB Statement No. 67 includes a specific requirement for the discount rate that is used for the purpose of the measurement of the Total Pension Liability. This rate considers the ability of the fund to meet benefit obligations in the future. To make this determination, employer contributions, employee contributions, benefit payments, expenses and investment returns are projected into the future. The Plan Net Position (assets) in future years can then be determined and compared to its obligation to make benefit payments in those years. As long as assets are projected to be on hand in a future year, the assumed valuation discount rate is used. In years where assets are not projected to be sufficient to meet benefit payments, the use of a municipal bond rate is required, as described in the following paragraph.

The Single Discount Rate (SDR) is equivalent to applying these two rates to the benefits that are projected to be paid during the different time periods. The SDR reflects: (1) the long-term expected rate of return on pension plan investments (during the period in which the fiduciary net position is projected to be sufficient to pay benefits); and (2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating (which is published by the Bond Buyer Index) as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

For the purpose of this valuation, the expected rate of return on pension plan investments is 6.80%; the municipal bond rate is 1.84%; and the resulting SDR is 6.80%.

We deemed administrative expenses to be immaterial for the purpose of developing the single discount rate and consequently did not include them in the calculation.

The tables in this section provide background for the development of the SDR.

The **Projection of Contributions** table shows the development of expected contributions in future years. Normal Cost contributions for future hires are not included (nor are their liabilities). The contribution rate for the first year was developed from the 2020 actuarial valuation (13.70%). Expected contribution rates gradually decrease as the unrecognized asset gains from the Market Recognition Account are phased in over the next five years. The expected contribution rate then remains level for 20 years and is assumed to migrate to the ultimate contribution rate of 9.23% once the Experience Amortization Reserve (EAR) component is paid down.

The **Projection of Plan Fiduciary Net Position** table shows the development of expected asset levels in future years.

The **Present Values of Projected Benefit Payments** table shows the development of the Single Discount Rate (SDR). It breaks down the benefit payments into present values for funded and unfunded portions and shows the equivalent total at the SDR.

The WRS funding policy as it affects the closed group cannot be modelled with 100% accuracy. In reality, assets that appear to be left over after all benefit obligations are satisfied would be assigned to the funding benefits of people who enter the plan after the measurement date.

# Single Discount Rate Development

## Projection of Contributions

### Ending December 31, 2121

Year	Payroll for Current Employees	Contributions from Current Employees	Normal Cost Contributions	UAL Contributions	Total Contributions
0	\$ 14,997,290,658				
1	14,472,811,332	\$ 927,938,771	\$ 1,054,836,381	\$ -	\$ 1,982,775,152
2	14,011,091,071	885,220,734	1,006,276,561	-	1,891,497,295
3	13,573,989,077	794,078,361	902,670,274	-	1,696,748,635
4	13,148,814,273	683,054,604	776,463,780	-	1,459,518,384
5	12,733,433,258	607,843,170	690,967,022	-	1,298,810,192
6	12,326,653,184	559,580,748	636,104,611	-	1,195,685,359
7	11,925,962,928	541,391,013	615,427,391	-	1,156,818,404
8	11,529,829,672	523,408,148	594,985,330	-	1,118,393,478
9	11,136,403,744	505,548,184	574,682,979	-	1,080,231,163
10	10,742,069,066	487,646,967	554,333,732	-	1,041,980,699
11	10,341,929,877	469,482,249	533,684,949	-	1,003,167,198
12	9,934,926,405	451,005,919	512,681,942	-	963,687,861
13	9,521,224,491	432,225,507	491,333,269	-	923,558,776
14	9,098,019,112	413,013,676	469,494,178	-	882,507,854
15	8,666,189,410	393,410,335	447,210,038	-	840,620,373
16	8,227,118,972	373,478,293	424,552,247	-	798,030,540
17	7,781,272,532	353,238,648	401,544,788	-	754,783,436
18	7,330,420,329	332,771,761	378,279,011	-	711,050,772
19	6,876,724,723	312,175,795	354,866,503	-	667,042,298
20	6,420,788,121	291,478,098	331,338,350	-	622,816,448
21	5,960,736,862	270,593,611	307,597,865	-	578,191,476
22	5,494,299,318	249,419,212	283,527,822	-	532,947,034
23	5,021,319,923	227,947,839	259,120,194	-	487,068,033
24	4,545,571,909	206,350,782	234,569,693	-	440,920,475
25	4,071,363,740	184,823,628	210,098,655	-	394,922,283
26	3,602,068,457	155,596,390	176,874,529	-	332,470,919
27	3,142,265,855	135,734,573	154,296,565	-	290,031,138
28	2,696,648,814	116,485,521	132,415,165	-	248,900,686
29	2,272,044,338	98,144,136	111,565,556	-	209,709,692
30	1,880,634,384	81,236,635	92,345,919	-	173,582,554
31	1,530,272,259	66,102,253	75,141,877	-	141,244,130
32	1,223,237,088	52,839,438	60,065,345	-	112,904,783
33	961,807,101	41,546,604	47,228,191	-	88,774,795
34	745,859,618	32,218,451	36,624,392	-	68,842,843
35	571,841,757	24,701,505	28,079,489	-	52,780,994
36	433,504,690	18,725,842	21,286,641	-	40,012,483
37	324,488,221	14,016,723	15,933,540	-	29,950,263
38	239,714,037	10,354,784	11,770,822	-	22,125,606
39	174,900,695	7,555,080	8,588,254	-	16,143,334
40	126,143,415	5,448,941	6,194,096	-	11,643,037
41	89,903,637	3,883,514	4,414,592	-	8,298,106
42	63,311,936	2,734,848	3,108,844	-	5,843,692
43	44,359,659	1,916,178	2,178,219	-	4,094,397
44	30,916,310	1,335,473	1,518,102	-	2,853,575
45	21,302,947	920,211	1,046,051	-	1,966,262
46	14,478,087	625,401	710,926	-	1,336,327
47	9,568,009	413,303	469,824	-	883,127
48	6,074,203	262,384	298,265	-	560,649
49	3,654,381	157,856	179,443	-	337,299
50	2,026,892	87,554	99,528	-	187,082





# Single Discount Rate Development

## Projection of Contributions Ending December 31, 2121

### (Concluded)

Year	Payroll for Current Employees	Contributions from Current Employees	Normal Cost Contributions	UAL Contributions	Total Contributions
51	\$ 983,682	\$ 42,492	\$ 48,302	\$ -	\$ 90,794
52	419,896	18,138	20,618	-	38,756
53	182,315	7,876	8,952	-	16,828
54	82,103	3,547	4,031	-	7,578
55	30,291	1,309	1,487	-	2,796
56	7,005	303	344	-	647
57	473	21	23	-	44
58	159	7	8	-	15
59	-	-	-	-	-
60	-	-	-	-	-
61	-	-	-	-	-
62	-	-	-	-	-
63	-	-	-	-	-
64	-	-	-	-	-
65	-	-	-	-	-
66	-	-	-	-	-
67	-	-	-	-	-
68	-	-	-	-	-
69	-	-	-	-	-
70	-	-	-	-	-
71	-	-	-	-	-
72	-	-	-	-	-
73	-	-	-	-	-
74	-	-	-	-	-
75	-	-	-	-	-
76	-	-	-	-	-
77	-	-	-	-	-
78	-	-	-	-	-
79	-	-	-	-	-
80	-	-	-	-	-
81	-	-	-	-	-
82	-	-	-	-	-
83	-	-	-	-	-
84	-	-	-	-	-
85	-	-	-	-	-
86	-	-	-	-	-
87	-	-	-	-	-
88	-	-	-	-	-
89	-	-	-	-	-
90	-	-	-	-	-
91	-	-	-	-	-
92	-	-	-	-	-
93	-	-	-	-	-
94	-	-	-	-	-
95	-	-	-	-	-
96	-	-	-	-	-
97	-	-	-	-	-
98	-	-	-	-	-
99	-	-	-	-	-
100	-	-	-	-	-

# Single Discount Rate Development

## Projection of Plan Fiduciary Net Position

### Ending December 31, 2121

Year	Projected Beginning Plan Net Position	Projected Total Contributions	Projected Benefit Payments Including Dividends	Projected Investment Earnings at 6.80%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)=(a)+(b)-(c)+(d)
1	\$ 141,847,700,859	\$ 1,982,775,152	\$ 7,087,510,639	\$ 9,474,936,941	\$ 146,217,902,314
2	146,217,902,314	1,891,497,295	7,551,224,172	9,753,551,254	150,311,726,690
3	150,311,726,690	1,696,748,635	8,127,673,385	10,006,141,795	153,886,943,736
4	153,886,943,736	1,459,518,384	8,625,062,217	10,224,690,264	156,946,090,168
5	156,946,090,168	1,298,810,192	9,036,462,889	10,413,580,412	159,622,017,883
6	159,622,017,883	1,195,685,359	9,291,583,092	10,583,563,477	162,109,683,627
7	162,109,683,627	1,156,818,404	9,539,370,115	10,743,138,794	164,470,270,709
8	164,470,270,709	1,118,393,478	9,784,299,554	10,894,183,103	166,698,547,736
9	166,698,547,736	1,080,231,163	10,025,738,472	11,036,355,837	168,789,396,264
10	168,789,396,264	1,041,980,699	10,268,586,701	11,169,133,356	170,731,923,618
11	170,731,923,618	1,003,167,198	10,508,732,860	11,291,896,567	172,518,254,523
12	172,518,254,523	963,687,861	10,737,926,948	11,404,382,399	174,148,397,835
13	174,148,397,835	923,558,776	10,956,101,888	11,506,594,237	175,622,448,959
14	175,622,448,959	882,507,854	11,163,099,759	11,598,534,750	176,940,391,804
15	176,940,391,804	840,620,373	11,368,058,706	11,679,900,108	178,092,853,579
16	178,092,853,579	798,030,540	11,561,854,911	11,750,362,557	179,079,391,766
17	179,079,391,766	754,783,436	11,738,335,869	11,810,099,260	179,905,938,593
18	179,905,938,593	711,050,772	11,903,334,442	11,859,324,293	180,572,979,216
19	180,572,979,216	667,042,298	12,056,726,407	11,898,081,816	181,081,376,923
20	181,081,376,923	622,816,448	12,195,949,335	11,926,518,176	181,434,762,213
21	181,434,762,213	578,191,476	12,326,284,709	11,944,697,553	181,631,366,532
22	181,631,366,532	532,947,034	12,447,809,273	11,952,489,748	181,668,994,042
23	181,668,994,042	487,068,033	12,561,246,059	11,949,720,763	181,544,536,778
24	181,544,536,778	440,920,475	12,668,673,348	11,936,121,995	181,252,905,900
25	181,252,905,900	394,922,283	12,768,710,425	11,911,407,551	180,790,525,309
26	180,790,525,309	332,470,919	12,859,977,418	11,874,825,197	180,137,844,007
27	180,137,844,007	290,031,138	12,938,059,078	11,826,412,529	179,316,228,596
28	179,316,228,596	248,900,686	13,002,345,908	11,767,017,437	178,329,800,810
29	178,329,800,810	209,709,692	13,053,971,228	11,696,903,372	177,182,442,647
30	177,182,442,647	173,582,554	13,083,433,416	11,616,689,654	175,889,281,440
31	175,889,281,440	141,244,130	13,085,871,995	11,527,591,719	174,472,245,294
32	174,472,245,294	112,904,783	13,059,510,070	11,431,167,135	172,956,807,142
33	172,956,807,142	88,774,795	12,999,276,316	11,329,324,681	171,375,630,302
34	171,375,630,302	68,842,843	12,905,261,034	11,224,282,066	169,763,494,178
35	169,763,494,178	52,780,994	12,777,910,561	11,118,378,396	168,156,743,007
36	168,156,743,007	40,012,483	12,618,567,583	11,014,020,892	166,592,208,798
37	166,592,208,798	29,950,263	12,431,087,673	10,913,565,565	165,104,636,954
38	165,104,636,954	22,125,606	12,217,587,952	10,819,288,630	163,728,463,237
39	163,728,463,237	16,143,334	11,978,490,379	10,733,504,392	162,499,620,584
40	162,499,620,584	11,643,037	11,714,230,313	10,658,629,680	161,455,662,988
41	161,455,662,988	8,298,106	11,425,370,011	10,597,188,441	160,635,779,524
42	160,635,779,524	5,843,692	11,110,861,157	10,551,871,733	160,082,633,792
43	160,082,633,792	4,094,397	10,772,903,622	10,525,500,914	159,839,325,481
44	159,839,325,481	2,853,575	10,418,733,573	10,520,758,204	159,944,203,687
45	159,944,203,687	1,966,262	10,052,599,548	10,540,104,084	160,433,674,485
46	160,433,674,485	1,336,327	9,675,618,824	10,585,973,590	161,345,365,578
47	161,345,365,578	883,127	9,289,030,063	10,660,881,288	162,718,099,930
48	162,718,099,930	560,649	8,894,010,065	10,767,426,246	164,592,076,760
49	164,592,076,760	337,299	8,491,510,656	10,908,309,126	167,009,212,529
50	167,009,212,529	187,082	8,082,214,658	11,086,356,543	170,013,541,495



# Single Discount Rate Development

## Projection of Plan Fiduciary Net Position

### Ending December 31, 2121 (Concluded)

Year	Projected Beginning Plan Net Position	Projected Total Contributions	Projected Benefit Payments Including Dividends	Projected Investment Earnings at 6.80%	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)=(a)+(b)-(c)+(d)
51	\$ 170,013,541,495	\$ 90,794	\$ 7,666,950,548	\$ 11,304,534,479	\$ 173,651,216,221
52	173,651,216,221	38,756	7,246,631,866	11,565,950,436	177,970,573,547
53	177,970,573,547	16,828	6,822,507,304	11,873,849,089	183,021,932,160
54	183,021,932,160	7,578	6,396,129,397	12,231,599,607	188,857,409,948
55	188,857,409,948	2,796	5,969,138,217	12,642,690,887	195,530,965,414
56	195,530,965,414	647	5,543,275,722	13,110,733,792	203,098,424,131
57	203,098,424,131	44	5,120,448,894	13,639,460,655	211,617,435,937
58	211,617,435,937	15	4,702,721,037	14,232,722,634	221,147,437,548
59	221,147,437,548	-	4,292,260,787	14,894,488,884	231,749,665,645
60	231,749,665,645	-	3,891,306,027	15,628,848,665	243,487,208,283
61	243,487,208,283	-	3,502,143,185	16,440,015,502	256,425,080,600
62	256,425,080,600	-	3,127,050,277	17,332,334,247	270,630,364,571
63	270,630,364,571	-	2,768,255,667	18,310,291,956	286,172,400,859
64	286,172,400,859	-	2,427,894,003	19,378,532,408	303,123,039,265
65	303,123,039,265	-	2,107,945,090	20,541,875,185	321,556,969,359
66	321,556,969,359	-	1,810,179,065	21,805,339,981	341,552,130,276
67	341,552,130,276	-	1,536,094,780	23,174,176,537	363,190,212,033
68	363,190,212,033	-	1,286,849,399	24,653,901,075	386,557,263,708
69	386,557,263,708	-	1,063,194,808	26,250,339,789	411,744,408,689
70	411,744,408,689	-	865,422,078	27,969,679,337	438,848,665,949
71	438,848,665,949	-	693,310,122	29,818,524,402	467,973,880,228
72	467,973,880,228	-	546,094,652	31,803,961,984	499,231,747,559
73	499,231,747,559	-	422,478,190	33,933,630,802	532,742,900,171
74	532,742,900,171	-	320,685,082	36,215,793,228	568,638,008,318
75	568,638,008,318	-	238,567,441	38,659,406,667	607,058,847,543
76	607,058,847,543	-	173,742,249	41,274,191,544	648,159,296,838
77	648,159,296,838	-	123,724,740	44,070,694,724	692,106,266,822
78	692,106,266,822	-	86,049,984	47,060,348,559	739,080,565,396
79	739,080,565,396	-	58,380,608	50,255,526,150	789,277,710,938
80	789,277,710,938	-	38,591,716	53,669,593,804	842,908,713,026
81	842,908,713,026	-	24,827,107	57,316,962,246	900,200,848,166
82	900,200,848,166	-	15,526,926	61,213,138,442	961,398,459,681
83	961,398,459,681	-	9,430,266	65,374,779,902	1,026,763,809,317
84	1,026,763,809,317	-	5,556,950	69,819,753,204	1,096,578,005,571
85	1,096,578,005,571	-	3,174,574	74,567,198,218	1,171,142,029,216
86	1,171,142,029,216	-	1,757,268	79,637,599,222	1,250,777,871,170
87	1,250,777,871,170	-	942,355	85,052,863,726	1,335,829,792,542
88	1,335,829,792,542	-	489,708	90,836,409,517	1,426,665,712,350
89	1,426,665,712,350	-	246,794	97,013,260,187	1,523,678,725,743
90	1,523,678,725,743	-	120,745	103,610,149,313	1,627,288,754,311
91	1,627,288,754,311	-	57,407	110,655,633,373	1,737,944,330,278
92	1,737,944,330,278	-	26,538	118,180,213,571	1,856,124,517,312
93	1,856,124,517,312	-	11,929	126,216,466,778	1,982,340,972,161
94	1,982,340,972,161	-	5,205	134,799,185,933	2,117,140,152,889
95	2,117,140,152,889	-	2,191	143,965,530,323	2,261,105,681,021
96	2,261,105,681,021	-	877	153,755,186,280	2,414,860,866,424
97	2,414,860,866,424	-	331	164,210,538,906	2,579,071,405,000
98	2,579,071,405,000	-	120	175,376,855,536	2,754,448,260,416
99	2,754,448,260,416	-	55	187,302,481,706	2,941,750,742,068
100	2,941,750,742,068	-	-	200,039,050,461	3,141,789,792,528

The Plan Fiduciary Net Position is projected to grow throughout the projection period due to the surplus as of the measurement date combined with the funding policy. Please note this is a theoretical closed group projection which does not take into account the projected payout of future new entrants into the System.



# Single Discount Rate Development

## Present Values of Projected Benefits

### Ending December 31, 2121

Year	Projected Beginning Plan Net Position	Projected Benefit		Unfunded Portion of Benefit Payments	Present Value of Funded Benefit Payments using Expected Return Rate (v)	Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf)	Present Value of Benefit Payments using Single Discount Rate (sdr)
		Payments Including Dividends	Funded Portion of Benefit Payments				
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v <sup>n</sup> ((a)-.5)	(g)=(e)*vf <sup>n</sup> ((a)-.5)	(h)=(c)/(1+sdr) <sup>n</sup> ((a)-.5)
1	\$ 141,847,700,859	\$ 7,087,510,639	\$ 7,087,510,639	\$ -	\$ 6,858,167,651	\$ -	\$ 6,858,167,651
2	146,217,902,314	7,551,224,172	7,551,224,172	-	6,841,644,189	-	6,841,644,189
3	150,311,726,690	8,127,673,385	8,127,673,385	-	6,895,060,976	-	6,895,060,976
4	153,886,943,736	8,625,062,217	8,625,062,217	-	6,851,140,156	-	6,851,140,156
5	156,946,090,168	9,036,462,889	9,036,462,889	-	6,720,906,169	-	6,720,906,169
6	159,622,017,883	9,291,583,092	9,291,583,092	-	6,470,648,747	-	6,470,648,747
7	162,109,683,627	9,539,370,115	9,539,370,115	-	6,220,231,621	-	6,220,231,621
8	164,470,270,709	9,784,299,554	9,784,299,554	-	5,973,726,641	-	5,973,726,641
9	166,698,547,736	10,025,738,472	10,025,738,472	-	5,731,400,057	-	5,731,400,057
10	168,789,396,264	10,268,586,701	10,268,586,701	-	5,496,468,884	-	5,496,468,884
11	170,731,923,618	10,508,732,860	10,508,732,860	-	5,266,865,147	-	5,266,865,147
12	172,518,254,523	10,737,926,948	10,737,926,948	-	5,039,077,515	-	5,039,077,515
13	174,148,397,835	10,956,101,888	10,956,101,888	-	4,814,103,286	-	4,814,103,286
14	175,622,448,959	11,163,099,759	11,163,099,759	-	4,592,750,937	-	4,592,750,937
15	176,940,391,804	11,368,058,706	11,368,058,706	-	4,379,284,335	-	4,379,284,335
16	178,092,853,579	11,561,854,911	11,561,854,911	-	4,170,355,698	-	4,170,355,698
17	179,079,391,766	11,738,335,869	11,738,335,869	-	3,964,430,990	-	3,964,430,990
18	179,905,938,593	11,903,334,442	11,903,334,442	-	3,764,191,536	-	3,764,191,536
19	180,572,979,216	12,056,726,407	12,056,726,407	-	3,569,942,582	-	3,569,942,582
20	181,081,376,923	12,195,949,335	12,195,949,335	-	3,381,241,448	-	3,381,241,448
21	181,434,762,213	12,326,284,709	12,326,284,709	-	3,199,790,278	-	3,199,790,278
22	181,631,366,532	12,447,809,273	12,447,809,273	-	3,025,596,384	-	3,025,596,384
23	181,668,994,042	12,561,246,059	12,561,246,059	-	2,858,772,116	-	2,858,772,116
24	181,544,536,778	12,668,673,348	12,668,673,348	-	2,699,645,257	-	2,699,645,257
25	181,252,905,900	12,768,710,425	12,768,710,425	-	2,547,717,950	-	2,547,717,950
26	180,790,525,309	12,859,977,418	12,859,977,418	-	2,402,554,579	-	2,402,554,579
27	180,137,844,007	12,938,059,078	12,938,059,078	-	2,263,241,685	-	2,263,241,685
28	179,316,228,596	13,002,345,908	13,002,345,908	-	2,129,669,772	-	2,129,669,772
29	178,329,800,810	13,053,971,228	13,053,971,228	-	2,001,990,210	-	2,001,990,210
30	177,182,442,647	13,083,433,416	13,083,433,416	-	1,878,753,376	-	1,878,753,376
31	175,889,281,440	13,085,871,995	13,085,871,995	-	1,759,460,254	-	1,759,460,254
32	174,472,245,294	13,059,510,070	13,059,510,070	-	1,644,115,883	-	1,644,115,883
33	172,956,807,142	12,999,276,316	12,999,276,316	-	1,532,334,088	-	1,532,334,088
34	171,375,630,302	12,905,261,034	12,905,261,034	-	1,424,392,992	-	1,424,392,992
35	169,763,494,178	12,777,910,561	12,777,910,561	-	1,320,540,198	-	1,320,540,198
36	168,156,743,007	12,618,567,583	12,618,567,583	-	1,221,041,958	-	1,221,041,958
37	166,592,208,798	12,431,087,673	12,431,087,673	-	1,126,311,209	-	1,126,311,209
38	165,104,636,954	12,217,587,952	12,217,587,952	-	1,036,486,138	-	1,036,486,138
39	163,728,463,237	11,978,490,379	11,978,490,379	-	951,500,147	-	951,500,147
40	162,499,620,584	11,714,230,313	11,714,230,313	-	871,263,012	-	871,263,012
41	161,455,662,988	11,425,370,011	11,425,370,011	-	795,672,851	-	795,672,851
42	160,635,779,524	11,110,861,157	11,110,861,157	-	724,503,910	-	724,503,910
43	160,082,633,792	10,772,903,622	10,772,903,622	-	657,740,426	-	657,740,426
44	159,839,325,481	10,418,733,573	10,418,733,573	-	595,614,745	-	595,614,745
45	159,944,203,687	10,052,599,548	10,052,599,548	-	538,093,366	-	538,093,366
46	160,433,674,485	9,675,618,824	9,675,618,824	-	484,938,599	-	484,938,599
47	161,345,365,578	9,289,030,063	9,289,030,063	-	435,920,325	-	435,920,325
48	162,718,099,930	8,894,010,065	8,894,010,065	-	390,807,702	-	390,807,702
49	164,592,076,760	8,491,510,656	8,491,510,656	-	349,364,846	-	349,364,846
50	167,009,212,529	8,082,214,658	8,082,214,658	-	311,353,228	-	311,353,228

# Single Discount Rate Development

## Present Values of Projected Benefits

### Ending December 31, 2121 (Concluded)

Year	Projected Beginning Plan Net Position	Projected Benefit Payments Including Dividends	Funded Portion of Benefit Payments	Unfunded Portion of Benefit Payments		Present Value of Funded Benefit Payments using Expected Return Rate (v)	Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf)	Present Value of Benefit Payments using Single Discount Rate (sdr)
(a)	(b)	(c)	(d)	(e)		(f)=(d)*v^((a)-.5)	(g)=(e)*vf ^((a)-.5)	(h)=(c)/(1+sdr)^(a-.5)
51	\$ 170,013,541,495	\$ 7,666,950,548	\$ 7,666,950,548	\$ -	-	\$ 276,550,470	\$ -	\$ 276,550,470
52	173,651,216,221	7,246,631,866	7,246,631,866	-	-	244,746,610	-	244,746,610
53	177,970,573,547	6,822,507,304	6,822,507,304	-	-	215,751,211	-	215,751,211
54	183,021,932,160	6,396,129,397	6,396,129,397	-	-	189,389,205	-	189,389,205
55	188,857,409,948	5,969,138,217	5,969,138,217	-	-	165,492,518	-	165,492,518
56	195,530,965,414	5,543,275,722	5,543,275,722	-	-	143,900,385	-	143,900,385
57	203,098,424,131	5,120,448,894	5,120,448,894	-	-	124,460,706	-	124,460,706
58	211,617,435,937	4,702,721,037	4,702,721,037	-	-	107,029,177	-	107,029,177
59	221,147,437,548	4,292,260,787	4,292,260,787	-	-	91,467,713	-	91,467,713
60	231,749,665,645	3,891,306,027	3,891,306,027	-	-	77,643,634	-	77,643,634
61	243,487,208,283	3,502,143,185	3,502,143,185	-	-	65,429,426	-	65,429,426
62	256,425,080,600	3,127,050,277	3,127,050,277	-	-	54,701,952	-	54,701,952
63	270,630,364,571	2,768,255,667	2,768,255,667	-	-	45,342,233	-	45,342,233
64	286,172,400,859	2,427,894,003	2,427,894,003	-	-	37,235,327	-	37,235,327
65	303,123,039,265	2,107,945,090	2,107,945,090	-	-	30,270,075	-	30,270,075
66	321,556,969,359	1,810,179,065	1,810,179,065	-	-	24,339,098	-	24,339,098
67	341,552,130,276	1,536,094,780	1,536,094,780	-	-	19,338,808	-	19,338,808
68	363,190,212,033	1,286,849,399	1,286,849,399	-	-	15,169,392	-	15,169,392
69	386,557,263,708	1,063,194,808	1,063,194,808	-	-	11,734,971	-	11,734,971
70	411,744,408,689	865,422,078	865,422,078	-	-	8,943,879	-	8,943,879
71	438,848,665,949	693,310,122	693,310,122	-	-	6,708,945	-	6,708,945
72	467,973,880,228	546,094,652	546,094,652	-	-	4,947,928	-	4,947,928
73	499,231,747,559	422,478,190	422,478,190	-	-	3,584,169	-	3,584,169
74	532,742,900,171	320,685,082	320,685,082	-	-	2,547,368	-	2,547,368
75	568,638,008,318	238,567,441	238,567,441	-	-	1,774,405	-	1,774,405
76	607,058,847,543	173,742,249	173,742,249	-	-	1,209,974	-	1,209,974
77	648,159,296,838	123,724,740	123,724,740	-	-	806,781	-	806,781
78	692,106,266,822	86,049,984	86,049,984	-	-	525,386	-	525,386
79	739,080,565,396	58,380,608	58,380,608	-	-	333,753	-	333,753
80	789,277,710,938	38,591,716	38,591,716	-	-	206,576	-	206,576
81	842,908,713,026	24,827,107	24,827,107	-	-	124,434	-	124,434
82	900,200,848,166	15,526,926	15,526,926	-	-	72,867	-	72,867
83	961,398,459,681	9,430,266	9,430,266	-	-	41,438	-	41,438
84	1,026,763,809,317	5,556,950	5,556,950	-	-	22,863	-	22,863
85	1,096,578,005,571	3,174,574	3,174,574	-	-	12,230	-	12,230
86	1,171,142,029,216	1,757,268	1,757,268	-	-	6,339	-	6,339
87	1,250,777,871,170	942,355	942,355	-	-	3,183	-	3,183
88	1,335,829,792,542	489,708	489,708	-	-	1,549	-	1,549
89	1,426,665,712,350	246,794	246,794	-	-	731	-	731
90	1,523,678,725,743	120,745	120,745	-	-	335	-	335
91	1,627,288,754,311	57,407	57,407	-	-	149	-	149
92	1,737,944,330,278	26,538	26,538	-	-	65	-	65
93	1,856,124,517,312	11,929	11,929	-	-	27	-	27
94	1,982,340,972,161	5,205	5,205	-	-	11	-	11
95	2,117,140,152,889	2,191	2,191	-	-	4	-	4
96	2,261,105,681,021	877	877	-	-	2	-	2
97	2,414,860,866,424	331	331	-	-	1	-	1
98	2,579,071,405,000	120	120	-	-	0	-	0
99	2,941,750,742,122	55	55	-	-	0	-	0
100	2,941,750,742,068	-	-	-	-	-	-	-
<b>Totals</b>						<b>\$ 152,152,694,350</b>	<b>\$ -</b>	<b>\$ 152,152,694,350</b>

## SECTION D

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### SUMMARY OF ASSUMPTIONS

# Summary of Assumptions Used to Develop Total Pension Liability Assumptions Adopted by DETF Board After Consulting with Actuary

The actuarial assumptions were developed based on an Experience Study covering January 1, 2018 through December 31, 2020. While sample rates are illustrated in this section, please refer to the Wisconsin Experience Study report dated November 19, 2021 which supplies a full listing of actuarial assumptions at every age and a rationale for the selection of assumptions.

## Economic Assumptions

In determining plan liabilities for accounting purposes, a discount rate of 6.80% is used for both actives and retirees. However, a long-term assumed dividend of 1.7% is also assumed. For retirees, this produces the same result as assuming a 5% discount rate. Dividends are not guaranteed, and this valuation develops dividends that reflect known entries (phased-in gains and losses) in the Market Recognition Account (MRA), based on the 6.80% return assumption. The dividend rates used in developing the Total Pension Liability for accounting purposes is as follows:

2021: 5.1% Core, 13.0% Variable  
2022: 7.4% Core, 15.0% Variable  
2023: 5.7% Core, 1.7% Variable  
2024: 7.1% Core, 1.7% Variable  
2025: 5.3% Core, 1.7% Variable  
2026: 3.8% Core, 1.7% Variable  
2027 and later: 1.7% Core, 1.7% Variable

The **Wage Inflation Rate** assumed in this valuation was 3.00% per year. The wage inflation rate is defined to be the portion of total pay increases for an individual that are due to macro-economic forces including productivity, price inflation, and labor market conditions. The wage inflation rate does not include pay changes rated to individual merit and seniority effects.

No specific **Price Inflation** assumption is required to perform this valuation. The price inflation assumption used to evaluate the investment return assumption is 2.4%.

The assumed **Real Rate of Return** over wage inflation is defined to be the portion of total investment return that is more than the assumed total wage growth rate. Considering other economic assumptions, the 6.8% pre-retirement investment return rate translates to an assumed real rate of return over wage inflation of 3.8%. The assumed real rate of return over price inflation would be 4.4%, considering an inflation assumption of 2.4%.

**Merit and Longevity pay increase assumptions** for individual active members are shown for sample services below. An additional 3.0% recognizes wage inflation, including price inflation, productivity increases, and other macroeconomic forces.

Service	% Merit Increases in Salaries Next Year								
	General Non-State (Not Including Schools)	General State (Not Including Schools)	University Teachers State	Public School Teachers Non-State	Protective With SS Non-State	Protective With SS State	Protective Without SS Non-State	Executive & Elected Non-State	Executive & Elected State
1	3.5%	3.5%	3.0%	5.6%	4.8%	4.8%	5.5%	2.5%	2.5%
2	3.5%	3.5%	3.0%	5.6%	4.8%	4.8%	5.5%	2.5%	2.5%
3	3.1%	3.1%	2.9%	5.2%	4.1%	4.1%	4.7%	2.0%	2.0%
4	2.8%	2.8%	2.8%	4.7%	3.5%	3.5%	3.8%	1.6%	1.6%
5	2.5%	2.5%	2.7%	4.3%	2.8%	2.8%	3.0%	1.1%	1.1%
10	1.5%	1.5%	2.2%	2.6%	1.1%	1.1%	0.9%	0.2%	0.2%
15	1.1%	1.1%	1.7%	1.4%	0.8%	0.8%	0.5%	0.2%	0.2%
20	0.9%	0.9%	1.2%	0.6%	0.7%	0.7%	0.4%	0.2%	0.2%
25	0.6%	0.6%	0.9%	0.3%	0.6%	0.6%	0.3%	0.2%	0.2%
30	0.4%	0.4%	0.7%	0.2%	0.5%	0.5%	0.2%	0.2%	0.2%



## Decrement Probabilities

The **mortality table** used was the 2020 WRS Experience Mortality Table adopted by the Board in connection with the 2018-2020 Experience Study. The rates in this table were based on actual WRS experience adjusted for future mortality improvements using the MP-2021 fully generational improvement scale from a base year of 2010. Sample retirement values from this table are shown below. This assumption is used to measure the probabilities of participants dying before retirement and the probabilities of each benefit payment being made after retirement.

**Single Life Retirement Values**  
**2020 WRS Experience Mortality Table with 5% Interest**

Sample Attained Ages in 2020	Present Value of \$1 Monthly for Life		Future Life Expectancy (years)		Probability of Death Next Year	
	Males	Females	Males	Females	Males	Females
40	\$216.42	\$218.21	47.0	49.1	0.060%	0.041%
45	208.39	210.68	41.7	43.8	0.079%	0.054%
50	198.20	201.19	36.5	38.6	0.122%	0.088%
55	185.60	189.68	31.4	33.5	0.247%	0.229%
60	170.69	176.24	26.5	28.6	0.423%	0.352%
65	153.28	160.03	21.8	23.8	0.682%	0.500%
70	133.15	140.66	17.4	19.2	1.137%	0.803%
75	110.57	118.54	13.3	14.8	2.092%	1.541%
80	87.01	95.10	9.7	10.9	4.003%	3.076%
85	64.58	72.19	6.7	7.7	7.683%	6.013%

The values shown above are for non-disabled participants. For disabled participants, the following table was used:

Sample Attained Ages in 2020	Present Value of \$1 Monthly for Life		Future Life Expectancy (years)		Probability of Death Next Year	
	Males	Females	Males	Females	Males	Females
40	\$175.14	\$178.77	32.0	34.7	0.928%	0.839%
45	164.45	168.29	28.0	30.7	1.191%	1.110%
50	152.59	158.01	24.3	26.9	1.717%	1.617%
55	140.59	148.54	20.9	23.5	2.341%	2.067%
60	128.98	138.60	18.0	20.4	2.965%	2.398%
65	117.23	126.39	15.3	17.4	3.506%	2.526%
70	103.95	111.06	12.7	14.2	4.146%	2.986%
75	88.28	93.53	10.1	11.1	5.348%	4.223%
80	71.49	75.63	7.7	8.4	7.649%	6.557%
85	55.59	59.37	5.7	6.2	11.483%	10.418%

## Active Participant Mortality Rates

Sample Attained Ages in 2020	Mortality Rates*	
	Males	Females
20	0.000396	0.000163
25	0.000211	0.000126
30	0.000339	0.000218
35	0.000484	0.000311
40	0.000604	0.000414
45	0.000792	0.000542
50	0.001188	0.000796
55	0.001905	0.001269
60	0.003127	0.001974
65	0.005010	0.003023
70	0.007534	0.005060
75	0.011093	0.009717
80	0.022172	0.019931

\* With a fully generational mortality table, the mortality rate depends on the year of birth. Later years of birth will typically correspond to a lower mortality rate at a given age.

This assumption is used to measure the probability of participants dying while in service.

# Rates of Retirement for Those Eligible to Retire

## Normal Retirement

Age	% of Active Participants Retiring												
	General Non-State		General State		Public Schools Non-State		University State		Protective			Executive & Elected Non-State	Executive & Elected State
	Male	Female	Male	Female	Male	Female	Male	Female	With SS Non-State *	With SS State *	Without SS Non-State*		
50									6%	8%	3%		
51									8%	9%	4%		
52									11%	11%	5%		
53									34%	25%	17%		
54									32%	20%	24%		
55									26%	20%	29%		
56									23%	20%	32%		
57	20%	17%	19%	19%	31%	28%	12%	10%	27%	20%	23%	10%	12%
58	20%	18%	19%	19%	29%	28%	16%	20%	21%	20%	27%	10%	12%
59	20%	14%	19%	19%	28%	26%	9%	12%	23%	20%	40%	10%	12%
60	20%	20%	19%	21%	27%	29%	15%	14%	22%	20%	25%	10%	12%
61	20%	18%	19%	25%	26%	27%	9%	13%	30%	20%	25%	10%	12%
62	30%	24%	28%	29%	39%	36%	10%	15%	35%	25%	31%	10%	18%
63	30%	29%	30%	28%	33%	31%	11%	19%	27%	25%	40%	10%	18%
64	30%	23%	25%	31%	30%	30%	16%	17%	30%	36%	40%	15%	18%
65	30%	35%	27%	31%	32%	39%	16%	21%	34%	38%	40%	15%	18%
66	40%	39%	35%	36%	35%	44%	21%	25%	35%	38%	100%	15%	18%
67	32%	33%	32%	33%	31%	31%	18%	25%	35%	38%	100%	15%	18%
68	32%	30%	21%	25%	28%	30%	19%	18%	35%	38%	100%	10%	18%
69	28%	22%	21%	27%	20%	30%	14%	17%	35%	38%	100%	10%	18%
70	28%	26%	21%	29%	30%	32%	21%	22%	100%	100%	100%	10%	18%
71	28%	28%	21%	34%	25%	25%	24%	17%	100%	100%	100%	10%	15%
72	28%	30%	21%	33%	25%	25%	24%	17%	100%	100%	100%	10%	15%
73	18%	30%	30%	24%	25%	25%	24%	21%	100%	100%	100%	20%	15%
74	18%	16%	30%	18%	25%	25%	24%	14%	100%	100%	100%	20%	15%
75	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

\* Includes reduced retirements for Protective with 20+ years of service.

## Reduced Retirement

Age	% of Active Participants Retiring									
	General Non-State		General State		Public Schools Non-State		University State		Executive & Elected Non-State	Executive & Elected State
	Male	Female	Male	Female	Male	Female	Male	Female		
55	7%	7%	6%	6%	12%	11%	3%	5%	3%	6%
56	6%	7%	7%	8%	13%	13%	3%	5%	3%	6%
57	5%	6%	6%	6%	13%	12%	4%	5%	3%	6%
58	6%	7%	6%	9%	12%	13%	4%	6%	3%	6%
59	6%	7%	7%	8%	14%	14%	4%	6%	3%	6%
60	9%	10%	9%	10%	16%	17%	5%	8%	5%	6%
61	8%	10%	13%	11%	16%	17%	5%	9%	5%	6%
62	19%	16%	16%	18%	23%	24%	7%	11%	1%	6%
63	20%	18%	17%	20%	21%	24%	8%	12%	1%	3%
64	18%	18%	21%	18%	21%	24%	12%	15%	1%	3%



**The assumed rates of separation** from employment prior to service retirement due to disability and other causes are shown below for sample ages. For other terminations it was assumed that a percentage depending on age of participants terminating after age 35 with 5 or more years of service will leave their contributions on deposit and be paid a benefit at normal retirement age and that the remaining participants would take a separation benefit. The percentage taking a separation benefit is 25% at age 35, grading downward to 0% at retirement eligibility. All participants terminating prior to normal retirement age with less than 5 years of service were assumed to take a separation benefit.

### Assumed Termination Rates by Attained Age and Years of Service

Age	Service	% of Active Participants Withdrawing												Executive & Elected Non-State	Executive & Elected State
		General Non-State		General State		Public Schools Non-State		University State		Protective					
		Male	Female	Male	Female	Male	Female	Male	Female	With SS Non-State	With SS State	Without SS Non-State			
Under 30	0-1	17.7%	20.0%	17.2%	19.5%	12.6%	12.0%	14.0%	14.1%	15.6%	18.8%	4.5%	25.0%	19.0%	
	1-2	12.5%	15.0%	12.9%	15.5%	11.6%	10.0%	13.8%	14.0%	9.4%	15.5%	4.0%	20.0%	16.0%	
	2-3	9.0%	11.5%	9.5%	12.5%	8.5%	8.5%	12.6%	12.7%	5.3%	10.5%	2.0%	17.0%	13.0%	
	3-4	7.1%	9.6%	7.4%	10.0%	6.0%	6.2%	11.0%	10.0%	4.4%	6.5%	1.8%	16.0%	12.5%	
	4-5	6.6%	9.0%	7.3%	8.7%	5.6%	5.8%	8.6%	9.3%	4.2%	5.5%	1.7%	13.0%	12.0%	
	5-6	5.3%	7.4%	6.1%	7.8%	4.5%	4.8%	8.5%	8.1%	3.3%	5.0%	1.3%	4.0%	6.0%	
	6-7	4.8%	6.3%	5.2%	6.9%	3.7%	4.1%	7.0%	7.0%	3.2%	4.5%	1.2%	4.0%	6.0%	
	7-8	4.6%	6.0%	5.1%	6.0%	2.9%	3.5%	5.6%	5.6%	3.0%	4.0%	0.9%	4.0%	6.0%	
	8-9	4.1%	5.7%	4.5%	5.6%	2.6%	3.4%	4.6%	4.9%	2.7%	3.5%	0.8%	4.0%	6.0%	
	9-10	4.0%	5.0%	3.6%	5.5%	2.5%	3.0%	4.3%	4.3%	2.3%	3.3%	0.7%	4.0%	6.0%	
	10 & Up	3.2%	4.9%	3.1%	4.8%	2.0%	2.2%	4.2%	4.0%	2.1%	2.9%	0.7%	4.5%	4.5%	
	35	2.8%	4.1%	2.7%	3.9%	1.6%	1.9%	4.0%	4.0%	1.8%	2.4%	0.6%	4.5%	4.5%	
	40	2.4%	3.2%	2.6%	3.0%	1.4%	1.6%	3.4%	3.7%	1.5%	1.8%	0.6%	4.2%	4.5%	
	45	2.0%	2.9%	2.4%	2.7%	1.4%	1.4%	2.8%	3.2%	1.4%	1.4%	0.5%	3.7%	4.2%	
	50	1.7%	2.5%	1.9%	2.1%	1.3%	1.2%	2.3%	2.7%	1.3%	1.2%	0.5%	3.2%	3.7%	
	54	1.6%	2.2%	1.7%	1.8%	1.3%	1.2%	2.2%	2.5%	1.3%	1.2%	0.5%	3.0%	3.5%	

### Disability Rates

Age	% of Active Participants Becoming Disabled													Executive & Elected Non-State	Executive & Elected State
	General Non-State		General State		Public Schools Non-State		University State		Protective						
	Male	Female	Male	Female	Male	Female	Male	Female	With SS Non-State	With SS State	Without SS Non-State				
20	0.01%	0.00%	0.01%	0.01%	0.01%	0.01%	0.00%	0.01%	0.02%	0.02%	0.03%	0.00%	0.00%		
25	0.01%	0.00%	0.01%	0.01%	0.01%	0.01%	0.00%	0.01%	0.02%	0.02%	0.03%	0.00%	0.00%		
30	0.01%	0.02%	0.01%	0.04%	0.01%	0.01%	0.00%	0.01%	0.02%	0.02%	0.03%	0.00%	0.00%		
35	0.01%	0.02%	0.01%	0.05%	0.01%	0.01%	0.00%	0.03%	0.03%	0.03%	0.03%	0.01%	0.01%		
40	0.03%	0.03%	0.03%	0.07%	0.01%	0.02%	0.01%	0.04%	0.04%	0.05%	0.05%	0.01%	0.01%		
45	0.06%	0.05%	0.06%	0.10%	0.03%	0.05%	0.02%	0.04%	0.05%	0.07%	0.10%	0.01%	0.01%		
50	0.13%	0.07%	0.13%	0.16%	0.08%	0.10%	0.03%	0.07%	0.09%	0.11%	0.55%	0.02%	0.02%		
55	0.24%	0.13%	0.24%	0.29%	0.14%	0.14%	0.08%	0.11%	1.39%	1.73%	0.41%	0.09%	0.09%		
60	0.43%	0.18%	0.43%	0.41%	0.24%	0.21%	0.11%	0.17%	2.34%	2.92%	0.12%	0.11%	0.11%		

## SECTION E

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### PLAN PROVISIONS

## Summary of Benefit Provisions

### Normal Retirement Eligibility

The age a participant becomes eligible for an unreduced age and service annuity is:

General, Public School, and University		Protective		Executive & Elected <sup>#</sup>	
Age	Service	Age	Service	Age	Service
65	Any*	54	Any*	62	Any*
57	30	53	25	57	30

*\* Participants first employed after 1989 and terminated before April 24, 1998 must have creditable service in 5 calendar years.*

*# These conditions apply to those people hired on or before December 31, 2016. For others, the General eligibility conditions apply.*

### Normal Retirement Annuity

The age and service annuity payable at Normal Retirement Age is based on Final Average Earnings (FAE) and Creditable Service (CS) as follows:

Multiplier for Service Rendered			Group
Before 2000	Between 2000 and 2011	After 2011	
2.165%	2.0%	1.6%	Executive group and elected officials
2.165%	2.0%	2.0%	Protective occupation participants covered by Social Security
2.665%	2.5%	2.5%	Protective occupation participants not covered by Social Security
1.765%	1.6%	1.6%	All other participants

FAE is generally the average of the 3 highest years of earnings (July 1 - June 30 for teachers, educational support staff, and judges; calendar year for others) preceding retirement. These years do not have to be consecutive. For legislators and state constitutional officers who are ineligible to receive pay increases during their term, FAE is the statutory rate of earnings at termination.

Maximum formula annuity is 85% of FAE for protective occupation participants not covered by Social Security, 65% of FAE for protectives covered by Social Security, and 70% for all other participants. If greater than the formula amount, an annuity equal to the actuarial equivalent of two times the required accumulated contributions is paid in lieu of the formula amount (i.e., the Money Purchase Minimum).

**Reduced Retirement.** Any participant who has attained age 55 and any Protective occupation participant who has attained age 50 may apply for a reduced retirement annuity. The benefit is reduced 0.4% for each month that the annuity effective date precedes the Normal Retirement Age. For Non-Protective participants terminating after 6/30/90, the 0.4% is reduced for months after the attainment of age 57 and before the annuity effective date by .001111% for each month of creditable service.

**Voluntary Termination Before Immediate Benefit Eligibility.** Participant may either (i) receive a refund of accumulated contributions, or (ii) leave contributions on deposit and apply for a retirement annuity on or after the minimum retirement age based upon age and accrued service at time of termination.

**Post-Retirement Adjustments.** Annuities are increased annually if the investment income credited to retired life funds is in excess of the assumed benefit rate (presently 5%), other plan experiences are within projected ranges, and the resulting adjustment would be at least 0.5% (2.0% for the variable fund).

**Disability Benefits.** Generally, disability means the inability to engage in any substantial gainful activity by reason of a medically determinable physical or mental impairment which can be expected to result in death or to be of long-continued and indefinite duration. Disability applicants must be participating employees who are under normal retirement age, have not already taken a WRS benefit and who meet a service requirement.

For this purpose **normal retirement age** is:

- 65 for general employees and executives and elected officials hired after December 31, 2016;
- 62 for executives and elected officials hired on or before December 31, 2016;
- 53 for protective occupation employees with 25 or more years of creditable service; and
- 54 for other protective occupation employees.

The **service requirement** is that during the seven years preceding application the individual must have earned:

- At least 6 months of service credit in five of those years; or
- A total of five years of service credit.

Protective occupation employees who become disabled between the ages of 50 and 55, who have at least 15 years of service, and who can no longer perform the duties of their position may apply for a special disability benefit until age 55.

**Disability Amount:** The disability benefit is the WRS formula benefit based upon service projected to normal retirement age as described above, without regard to the reduced retirement reduction.

#### **Death-in-Service.**

- (a) Prior to age 50 for Protective participants, age 55 for others, the benefit is the equivalent of twice the accumulated employee contributions required and all additional contributions and employer amounts contributed prior to 1974 for teachers, or 1966 for others.
- (b) After age 50 for Protective participants, age 55 for others, the benefit is the amount that would have been paid if participant had retired and elected 100% survivor option. Benefit is payable to any natural living person. If there is no eligible beneficiary, a refund of contributions is paid to the estate.



**Interest Credits.** For years after 1999, and for people with some active service after 1999, participant core accounts (including the variable at core accounts) are credited with interest at the full (core) effective rate. For others, accounts are credited with interest as follows:

Date of Participation	Rate Credited for Purpose of	
	Money Purchase Minimum	Refunds
Prior to 1982	Actual	Actual
January 1, 1982 & Later	5%	3%

Participant variable accounts are credited with interest based on the earnings in the variable portfolio.

**Contribution Rates.** The financial objective of WRS is to establish and receive contributions that will remain level from year to year and decade to decade.

Statutory required participant contributions prior to July 1, 2011 were as follows:

General, Public School, and University	5.0%
Executives & Elected Officials	5.5
Protectives	
- With Social Security	6.0
- Without Social Security	8.0

Statutory required participant contributions after July 1, 2011 are set equal to one-half of the actuarially determined rate for General participants and Executive and Elected Officials. Participant contributions for Protective participants are set equal to the participant contribution for General members.

**Normal Form of Benefit.** The normal form of benefit is a straight life annuity with no death benefits. Optional forms of benefit which are actuarially reduced are listed below:

- A life annuity with 60 or 180 monthly payments guaranteed;
- A joint survivorship annuity with 75% continued to beneficiary;
- A joint survivorship annuity with 100% continued to beneficiary;
- A joint survivorship annuity reduced 25% upon either your death or your beneficiary's death; and
- A joint survivorship annuity with 100% continued to beneficiary combined with 180 monthly payments guaranteed.

For formula benefit calculations, optional forms are calculated at the lower of the current age or age 62 (Normal Retirement Age for Protective occupations). If a retiree (and beneficiary if in receipt of a joint survivorship annuity) dies prior to receiving benefits which, in total, are at least equal to the members contributions, a "residual refund" for the difference is paid.

**Vesting.** Participants hired prior to July 1, 2011 vest immediately. After July 1, 2011, participants vest after 5 years of service.





## SECTION F

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### **GLOSSARY OF TERMS**

Auditor's Note – This information is presented in draft form for review by the Plan's auditor. Please let us know if there are any items that the auditor changes so that we may maintain consistency with the Plan's financial statements.

## Glossary of Terms

<b><i>Accrued Service</i></b>	Service credited under the system which was rendered before the date of the actuarial valuation.
<b><i>Actuarial Accrued Liability (AAL)</i></b>	The AAL is the difference between the actuarial present value of all benefits and the actuarial value of future normal costs. The definition comes from the fundamental equation of funding which states that the present value of all benefits is the sum of the AAL and the present value of future normal costs. The AAL may also be referred to as "accrued liability" or "actuarial liability."
<b><i>Actuarial Assumptions</i></b>	These assumptions are estimates of future experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and compensation increases. Actuarial assumptions are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (compensation increases, payroll growth, inflation and investment return) consist of an underlying real rate of return plus an assumption for a long-term average rate of inflation.
<b><i>Actuarial Cost Method</i></b>	A mathematical budgeting procedure for allocating the dollar amount of the actuarial present value of the pension trust benefits between future normal cost and actuarial accrued liability. The actuarial cost method may also be referred to as the actuarial funding method.
<b><i>Actuarial Equivalent</i></b>	A single amount or series of amounts of equal actuarial value to another single amount or series of amounts, computed on the basis of appropriate actuarial assumptions.
<b><i>Actuarial Gain (Loss)</i></b>	The difference in liabilities between actual experience and expected experience during the period between two actuarial valuations is the gain (loss) on the accrued liabilities.
<b><i>Actuarial Present Value (APV)</i></b>	The amount of funds currently required to provide a payment or series of payments in the future. The present value is determined by discounting future payments at predetermined rates of interest and probabilities of payment.
<b><i>Actuarial Valuation</i></b>	The actuarial valuation report determines, as of the actuarial valuation date, the service cost, total pension liability, and related actuarial present value of projected benefit payments for pensions.
<b><i>Actuarial Valuation Date</i></b>	The date as of which an actuarial valuation is performed.
<b><i>Actuarially Determined Contribution (ADC) or Annual Required Contribution (ARC)</i></b>	A calculated contribution into a defined benefit pension plan for the reporting period, most often determined based on the funding policy of the plan. Typically, the Actuarially Determined Contribution has a normal cost payment and an amortization payment.

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<b><i>Amortization Method</i></b>	The method used to determine the periodic amortization payment may be a level dollar amount, or a level percent of pay amount. The period will typically be expressed in years, and the method will either be “open” (meaning, reset each year) or “closed” (the number of years remaining will decline each year).
<b><i>Amortization Payment</i></b>	The amortization payment is the periodic payment required to pay off an interest-discounted amount with payments of interest and principal.
<b><i>Cost-of-Living Adjustments</i></b>	Postemployment benefit changes intended to adjust benefit payments for the effects of inflation.
<b><i>Cost-Sharing Multiple-Employer Defined Benefit Pension Plan (cost-sharing pension plan)</i></b>	A multiple-employer defined benefit pension plan in which the pension obligations to the employees of more than one employer are pooled and pension plan assets can be used to pay the benefits of the employees of any employer that provides pensions through the pension plan.
<b><i>Covered-Employee Payroll</i></b>	The payroll of covered employees, which is typically only the pensionable pay and does not include pay above any pay cap.
<b><i>Deferred Inflows and Outflows</i></b>	The deferred inflows and outflows of pension resources are amounts used under GASB Statement No. 68 in developing the annual pension expense/(income). Deferred inflows and outflows arise with differences between expected and actual experiences; changes of assumptions. The portion of these amounts not included in pension expense/(income) should be included in the deferred inflows or outflows of resources.
<b><i>Deferred Retirement Option Program (DROP)</i></b>	A program that permits a plan member to elect a calculation of benefit payments based on service credits and salary, as applicable, as of the DROP entry date. The plan member continues to provide service to the employer and is paid for the service by the employer after the DROP entry date; however, the pensions that would have been paid to the plan member are credited to an individual member account within the defined benefit pension plan until the end of the DROP period. Other variations for DROP exist and will be more fully detailed in the plan provision section of the valuation report.
<b><i>Discount Rate</i></b>	<p>For GASB purposes, the discount rate is the single rate of return that results in the present value of all projected benefit payments to be equal to the sum of the funded and unfunded projected benefit payments, specifically:</p> <ol style="list-style-type: none"><li>1. The benefit payments to be made while the pension plans’ fiduciary net position is projected to be greater than the benefit payments that are projected to be made in the period; and</li><li>2. The present value of the benefit payments not in (1) above, discounted using the municipal bond rate.</li></ol>

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<b><i>Entry Age Actuarial Cost Method (EAN)</i></b>	The EAN is a funding method for allocating the costs of the plan between the normal cost and the accrued liability. The actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis (either level dollar or level percent of pay) over the earnings or service of the individual between entry age and assumed exit age(s). The portion of the actuarial present value allocated to a valuation year is the normal cost. The portion of this actuarial present value not provided for at a valuation date by the actuarial present value of future normal costs is the actuarial accrued liability. The sum of the accrued liability plus the present value of all future normal costs is the present value of all benefits.
<b><i>Fiduciary Net Position</i></b>	The fiduciary net position is the market value of the assets of the trust dedicated to the defined benefit provisions.
<b><i>GASB</i></b>	The Governmental Accounting Standards Board is an organization that exists in order to promulgate accounting standards for governmental entities.
<b><i>Long-Term Expected Rate of Return</i></b>	The long-term rate of return is the expected return to be earned over the entire trust portfolio based on the asset allocation of the portfolio.
<b><i>Money-Weighted Rate of Return</i></b>	The money-weighted rate of return is a method of calculating the returns that adjusts for the changing amounts actually invested. For purposes of GASB Statement No. 67, money-weighted rate of return is calculated as the internal rate of return on pension plan investments, net of pension plan investment expense.
<b><i>Multiple-Employer Defined Benefit Pension Plan</i></b>	A multiple-employer plan is a defined benefit pension plan that is used to provide pensions to the employees of more than one employer.
<b><i>Municipal Bond Rate</i></b>	The Municipal Bond Rate is the discount rate to be used for those benefit payments that occur after the assets of the trust have been depleted.
<b><i>Net Pension Liability/(Asset) (NPL)</i></b>	The NPL is the liability of employers and non-employer contribution entities to plan members for benefits provided through a defined benefit pension plan.
<b><i>Non-Employer Contribution Entities</i></b>	Non-employer contribution entities are entities that make contributions to a pension plan that is used to provide pensions to the employees of other entities. For purposes of the GASB accounting statements, plan members are not considered non-employer contribution entities.
<b><i>Normal Cost</i></b>	The actuarial present value of the pension trust benefits allocated to the current year by the actuarial cost method.

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<b><i>Other Postemployment Benefits (OPEB)</i></b>	All postemployment benefits other than retirement income (such as death benefits, life insurance, disability, and long-term care) that are provided separately from a pension plan, as well as postemployment health care benefits regardless of the manner in which they are provided. Other postemployment benefits do not include termination benefits.
<b><i>Real Rate of Return</i></b>	The real rate of return is the rate of return on an investment after adjustment to eliminate inflation.
<b><i>Service Cost</i></b>	The service cost is the portion of the actuarial present value of projected benefit payments that is attributed to a valuation year.
<b><i>Total Pension Expense/(Income)</i></b>	<p>The total pension expense/(income) is the sum of the following items that are recognized at the end of the employer's fiscal year:</p> <ol style="list-style-type: none"><li>1. Service Cost</li><li>2. Interest on the Total Pension Liability</li><li>3. Current-Period Benefit Changes</li><li>4. Employee Contributions (made negative for addition here)</li><li>5. Projected Earnings on Plan Investments (made negative for addition here)</li><li>6. Pension Plan Administrative Expense</li><li>7. Other Changes in Plan Fiduciary Net Position</li><li>8. Recognition of Outflow (Inflow) of Resources due to Liabilities</li><li>9. Recognition of Outflow (Inflow) of Resources due to Assets</li></ol>
<b><i>Total Pension Liability (TPL)</i></b>	The TPL is the portion of the actuarial present value of projected benefit payments that is attributed to past periods of member service.
<b><i>Unfunded Actuarial Accrued Liability (UAAL)</i></b>	The UAAL is the difference between actuarial accrued liability and valuation assets.
<b><i>Valuation Assets</i></b>	The valuation assets are the assets used in determining the unfunded liability of the plan. For purposes of GASB Statement Nos. 67 and 68, the valuation assets are equal to the market value of assets.